

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 14-20 and 30-42 are in this application. Claim 14 has been amended. Claims 1-13 and 21-29 have been cancelled. Claims 30-42 have been added to alternately and additionally claim the present invention.

The Examiner objected to claims 19 and 28 because claims 19 and 28 repeat what is recited in claims 18 and 27, respectively. Applicant notes that claim 18 refers to a "contact," while claim 19 refers to a "via." A contact is a structure which makes an electrical connection with a semiconductor structure, such as the gate of a MOS transistor or the surface of the substrate, and a trace from the metal-1 layer.

Although similar, a via is a structure which makes electrical connections between traces from adjacent metal layers, such as between traces from the metal-2 and metal-3 layers. Thus, from what applicant can determine, claims 18 and 19 do not recite the same thing. With respect to claims 28 and 29, as noted above, these claims have been cancelled.

The Examiner rejected claim 24 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As noted above, claim 24 has been cancelled.

The Examiner rejected claims 22-24 and 27-29 under 35 U.S.C. §102(b) as being anticipated by Lu et al. (U.S. Patent No. 6,107,177). As noted above, claims 22-24 and 27-29 have been cancelled.

The Examiner also rejected claims 14-16 and 18-20 under 35 U.S.C. §103(a) as being unpatentable over Lu et al. in view of Adams (U.S. Patent No. 6,566,242 B1). For the reasons set forth below, applicant respectfully traverses this rejection as applied to amended claim 14.

Amended claim 14 recites, in part:

“etching the layer of insulation material to form a plurality of trenches in the layer of insulation material, each trench having a depth measured normal to the top surface of the substrate, a width, and a length that is many times greater than the width, directions associated with the depth, width, and length being orthogonal to each other, the top surface of the layer of insulation material having a trench region that lies between adjacent trenches, each trench having a bottom surface vertically spaced a first distance apart from the top surface.”

In rejecting the claims, the Examiner pointed to the etching step which forms trench 24 shown in FIG. 5 of Lu as teaching the step of etching a layer of insulation material. The Examiner noted that the Lu reference does not teach forming a plurality of trenches as required by claim 14, but argued that it would be obvious to do so in view of the Adams reference.

With regard to the Adams reference, the Examiner appears to be arguing that the Adams reference teaches the formation of trenches as evidenced by the formation of openings 910 shown in FIG. 9 of Adams. Applicant notes, however, that Adams also teaches that these openings 910 are subsequently filled with a conductive material to form vias 1251 and 1252 as shown in FIGS. 11-12 of Adams.

In addition, as shown FIG. 14B, Adams teaches in the plan view that vias 1251 and 1252, along with vias 1410, have a circular top surface, and must therefore have a cylindrical shape. Thus, since the vias 1251 and 1252 fill the openings 910, the openings 910 must also have cylindrical shapes. As a result, since the openings 910 are cylindrically-shaped, the openings 910 can not be read to be the trenches required by claim 14. This is because claim 14 defines the depth measurement to be normal to the surface of the substrate. Given this definition, a cylindrically-shaped via opening does not have a length that is many times greater than its width.

As a result, even if the Lu and Adams references were combined, neither of the references teaches or suggests the formation of trenches. As noted by the Examiner, the Lu reference does not teach the formation of trenches. In addition, as just discussed, the Adams reference does not teach the formation of trenches, but instead teaches the formation of via openings.

Therefore, since a via opening can not be read to be a trench in this case (does not have a length many times greater than its width), neither the Lu nor the Adams reference teaches or suggests the formation of trenches as required by claim 14. Thus, since neither reference teaches the formation of trenches, claim 14 is patentable over Lu in view of Adams. In addition, claims 15-16 and 18-20 depend either directly or indirectly from claim 14. As a result, claims 15-16 and 18-20 are patentable over Lu in view of Adams for the same reasons as claim 14.

The Examiner also rejected claims 17 and 25-26 under 35 U.S.C. §103(a) as being unpatentable over Lu et al. in view of Adams and further in view of Yu et al. (U.S. Patent No. 5,952,704). In rejecting the claims, the Examiner argued that Lu in view of Adams teaches all of the limitations of the claims, except for loops lying in the same plane. However, as noted above with respect to claim 14, Lu in view of Adams does not teach all of the limitations of the claims. Thus, claim 17, which indirectly depends from claim 14, is patentable over Lu in view of Adams and further in view of Yu for the same reasons that claim 14 is patentable over Lu in view of Adams. In addition, as noted above, claims 25 and 26 have been cancelled.

With respect to new claim 39, this claim also recites etching the layer of insulation material to form a plurality of trenches. As a result, claim 39 is patentable over Lu in view of Adams for the same reason that claim 14 is patentable over Lu in view of Adams. In addition, new claims 40-42 depend either directly or indirectly from claim 39. As a result, claims 40-42 are patentable over Lu in view of Adams for the same reason that claim 39 is patentable over Lu in view of Adams. Further, new claims 30-38 depend either directly or indirectly from claim 14. As a result, claims

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30-38 are patentable over Lu in view of Adams for the same reason that claim 14 is patentable over Lu in view of Adams.

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are requested.

Respectfully submitted,

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